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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/645,129	08/21/2003	Yasuo Amemiya	YOR903281US1	7118
23405	7590	04/12/2006	EXAMINER	
HESLIN ROTHENBERG FARLEY & MESITI PC 5 COLUMBIA CIRCLE ALBANY, NY 12203			ELLIS, KEVIN L	
		ART UNIT		PAPER NUMBER
				2188

DATE MAILED: 04/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/645,129	AMEMIYA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Kevin L. Ellis	2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 1/23/06.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-3,5, and 7-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-3, 5, 7-12, 14, 16-20, 22-28, and 30 is/are rejected.
- 7) Claim(s) 13,15,21 and 29 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                     | Paper No(s)/Mail Date. _____ .  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____ .                                  |

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**Detailed Action**

1. Claims 1-3, 5, and 7-30 are presented for examination. This Office Action is in response to the Amendment filed 1/23/06.

***Claim Rejections – 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
- (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 1-3, 5, 7-12, 14, 16-20, 22, and 23 are rejected under 35 U.S.C. § 102(b) as being anticipated by Bandera et al., U.S. Patent 6,223,252.

A) As to claims 1, 3, 16, 19, and 23, Bandera et al. teaches a method in figures 2A, B and an apparatus in figure 1. As shown in figure 1, there is a RAID drive group (a grouping of storage media) or disk array 110, with a storage controller 12, disk drives 114a-f, with data drives 114a-d, a parity drive 114e and a hot spare drive 114f (col 4, lines 21-37). As taught at col 3, lines 39-61, the hot spare drive 114f may be a "global hot spare" shared by all RAID groups, wherein the storage controller 112 mirrors a selected drive within drives 114a-e to the hot spare 114f. Continuing on col 3 line 62 to col 4 line 21, one

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finds that a variety of error information for the disks 114a-e is collected, with the disk most likely to fail being grouped with the hot spare 114f. SMART and PFA technology associated with the disk drives is set forth at col 5 lines 17-53, with various types of errors that are tracked periodically. Turning to figure 2B and steps 210, 212, 206, and 208 and col 5 line 54 to col 6 line 62, there is a method to group a RAID device hot spare with the drive that is most likely to fail (i.e. the claimed "grouping at least a portion of storage media") based upon the parameter information obtained for one or more parameters (i.e. predictive failure analysis using the number of bad blocks or storage regions, temperature, fly height, seek errors, sector reassigned, and other errors) which is used to select the drive most likely to fail, with that disk being grouped with the hot spare. As taught on col 6 lines 30-52, the drive to be mirrored can be switched during operation, based upon a selected period upon which to re-perform the predictive failure analysis, with a "new" drive selected as most likely to fail, with the hot spare mirroring then switched to this drive, thus setting forth a "re-grouping" of at least a portion of the drives. As for the parameters set forth in claim 3, these parameters are taught by Bandera et al. at col 5 lines 17-36 and col 6 lines 4-18. For example, a servo error parameter (per the spec, a seek error [0034]) is measured as a seek error (see Col 6 Line 11); an environmental condition (per the spec temperature [0036]) is monitored as temperature (col 6 line 10).

- B) As to claims 2 and 17, the RAID group is one array that is created with the hot spare assigned to the drive most likely to fail.

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- C) As to claims 5 and 18, a storage medium function (per the spec defective sectors [0035]) is a number of bad blocks or storage regions (col 5 lines 63-67).
  - D) As to claim 7, a state of one or more internal components (per the spec a head flyheight [0037]) is monitored as the fly height (col 6 line 10).
  - E) As to claim 8, the above parameters are used to select the drive most likely to fail which is then used to mirror to the hot spare for a particular RAID array grouping.
  - F) As to claims 9 and 20, a reconfiguring occurs as taught at col 6 lines 31-52 by performing a predictive failure analysis during operation.
  - G) As to claim 10, this occurs periodically (i.e. based upon the MTBF).
  - H) As to claim 11, the plurality of storage media are storage devices (see figure 1).
  - I) As to claim 12, the plurality of storage media (i.e. disks) would have a plurality of surfaces.
  - J) As to claims 14 and 22, Bandera et al. does select based upon a chosen criteria and the writing data can be read upon the hot spare being mapped to the group.

***Claim Rejections – 35 USC § 103***

4. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 24-28 and 30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Bandera et al., U.S. Patent 6,223,252.

A) As to claims 24, Bandera et al. discloses the invention substantially as claimed.

There is a method of grouping storage media comprising obtaining parameter information for one or more parameters associated with a plurality of storage media and grouping at least a portion of storage media of the plurality of storage media into one or more groups of storage media based on at least one parameter of the one or more parameters (see rejection to claim 1 above for citations). However, Bandera et al. does not disclose that this method is implemented as a computer program. It would have been obvious to one having ordinary skill in the art at the time the invention was made that the invention of Bandera et al. could be implemented in software as well as hardware which would allow faster debugging of the steps to perform the invention.

B) As to claims 25, 26, 27, 28, and 30, these claim limitations have been addressed with respect to claims 2, 5, 8, 9, and 14 above and the rejection applies here as well.

#### *Allowable Claims*

6. Claims 13, 15, 21, and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin L. Ellis whose telephone number is 571-272-4205. The examiner can normally be reached on weekdays from M-F 6AM-2:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on 571-272-4210. The fax phone numbers for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2100.

Kevin L. Ellis  
Primary Examiner  
April 11, 2006

*Kevin L. Ellis*